NPTEL Video Course - Electrical Engineering - NOC:Power Network Analysis

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Co-ordinating Institute - IIT Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction
Lecture 2 - Basic Circuit Principles - Phasor Diagrams
Lecture 3 - Basic Circuit Principles - Power in 1â AC circuit
Lecture 4 - Basic Circuit Principles - Power in 3â AC circuit
Lecture 5 - Transformers and per unit analysis - Basics of Transformers
Lecture 6 - Transformers and per unit analysis - Basics and 3â transformers
Lecture 7 - Transformers and per unit analysis - per unit analysis
Lecture 8 - Transformers and per unit - example
Lecture 9 - Synchronous - Basics of 3â machines
Lecture 10 - Synchronous Generators - Induced emf, armature reaction
Lecture 11 - Synchronous Generators - equivalent circuit representation
Lecture 12 - Synchronous Generators - power expressions and capability curves
Lecture 13 - Synchronous Generators - capability curves
Lecture 14 - Synchronous Generators - Real and reactive power control
Lecture 15 - Synchronous Generators - Economic Dispatch
Lecture 16 - Synchronous Generators - Parallel Operation
Lecture 17 - Transmission line parameters - line resistance
Lecture 18 - Transmission line parameters - inductance due to internal flux
Lecture 19 - Transmission line parameters - inductance between points outside conductor
Lecture 20 - Transmission line parameters - magnetic flux linkage of a conductor in a group of conductors
Lecture 21 - Transmission line parameters - inductance of 3â lines
Lecture 22 - Transmission line parameters - capacitance evaluation
Lecture 23 - Transmission line parameters - capacitance of 3â lines, effect of earth
Lecture 24 - Transmission line parameters - use of tables for reactance calculation and example
Lecture 25 - Transmission line models and performance - basics, two-port network
Lecture 26 - Transmission line models and performance - short line model
Lecture 27 - Transmission line models and performance - medium line model
Lecture 28 - Transmission line models and performance - long line model
Lecture 29 - Transmission line models and performance - long line model, lossless long line

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Lecture 30 - Transmission line models and performance - surge impedance loading, complex power flow
Lecture 31 - Transmission line models and performance - reactive power compensation
Lecture 32 - Power flow analysis - Basic circuit analysis
Lecture 33 - Power flow analysis - Basis/ assumptions in power flow, Bus admittance matrix
Lecture 34 - Power flow analysis - Effect of mutually coupled impedances and transformer taps in bus admittan
Lecture 35 - Power flow analysis - equations, classification of buses
Lecture 36 - Power flow analysis - equations, classification of buses
Lecture 37 - Power flow analysis - Gauss-Seidel method
Lecture 38 - Power flow analysis - Newton-Raphson method (polar coordinates)
Lecture 39 - Power flow analysis - Newton-Raphson method (rectangular coordinates)
Lecture 40 - Power flow analysis - Fast Decoupled method
Lecture 41 - Power flow analysis - DC Power flow
Lecture 42 - Power flow analysis - backward-forward technique for distribution networks
Lecture 43 - Fault analysis - Synchronous machine parameter variations, time constants
Lecture 44 - Fault analysis - Behaviour of synchronous machine just after a fault, difference between power f
Lecture 45 - Fault analysis - Basis of Theveninâ s theorem
Lecture 46 - Fault analysis - Balanced fault analysis
Lecture 47 - Fault analysis - Fortescueâ s theorem and sequence components
Lecture 48 - Fault analysis - Unbalanced fault analysis
Lecture 49 - Fault analysis - Unbalanced fault analysis
Lecture 50 - Fault analysis - Solved examples
Lecture 51 - Fault analysis - Protection challenges due to Renewable Energy (RE) resource integration
Lecture 52 - Stability analysis - Basics and classification of power system stability
Lecture 53 - Stability analysis - Swing equation - Part I
Lecture 54 - Stability analysis - Swing equation - Part II
Lecture 55 - Stability analysis - Ward reduction, Single machine infinite bus system
Lecture 56 - Stability analysis - Synchronizing power coefficient, Equal area criteria
Lecture 57 - Stability analysis - More on equal area criteria, Basics of numeric integration
Lecture 58 - Stability analysis - Solved examples
Lecture 59 - Stability analysis - Multi-machine transient rotor angle stability
Lecture 60 - Stability analysis - Challenge with RE integration
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